CLAIMS

1. Optical switch comprising at least one input optical path (31) and at least a first and a second output optical paths (35,37) and a micromirror (41) able to move between an output of the input optical path and inputs of the first and second output optical paths, the input optical path and the first output optical path having an identical optical axis, called first optical axis, and the second output optical path having an optical axis called second optical axis, the micromirror comprising a reflector part (13) and an actuating part (15) having an axis of rotation (17) and able to drive the reflector part in rotation about a plane called a tilt plane (B), the tilt plane being perpendicular to a plane containing the axis of rotation, and said reflector part including at least one reflective face (R) in a plane parallel to the tilt plane able to reflect a light wave derived from the input path towards the second output path, the first and second optical axes respectively forming an angle α relative to an axis of symmetry (S), the optical switch further comprising a control device to tilt the reflector part, this control device comprising a first set of electrodes (J1) arranged on the actuating part, a second set of electrodes (J2) arranged facing the first set, and means for applying a potential difference between the two sets of electrodes.

2. Optical switch as in claim 1, characterized in that it comprises a first input optical path (31)

associated with a first and a second output optical paths (35,37) and a second input optical path (31') associated with a third and fourth output optical paths (35',37'), the micromirror being able to interpose itself either between an output of the first input optical path and inputs of the first and second output optical paths, or between an output of the second input optical path and inputs of the third and fourth output optical paths.

3. Optical switch as in claim 1 or 2, characterized in that the input and output optical paths are chosen independently from one another from among optical fibres or optical guides.

4. Optical switch as in any of claims 1 to 3, characterized in that the input and output optical paths are respectively optical guides in a fist substrate (S1), said substrate further comprising a recess (39) able to allow rotation of the reflector part about the so-called tilt plane (B).

5. Optical switch as in any of claims 1 to 4, characterized in that angle α is non zero.

6. Optical switch as in any of claims 1 to 5, characterized in that each set of electrodes comprises at least one electrode (J1, J21, J22).

7. Optical switch as in any of the preceding claims, characterized in that the micromirror comprises

at least one limit stop (23) able to limit the movement of the reflector part (13).

8. Optical switch as in claim 7, characterized in that the limit stop, in a switch with a single input path and two output paths, is formed by a boss at one end of the reflector part, the width of said boss in a plane perpendicular to the tilt plane being greater than the width of the recess along the same plane.

9. Method for fabricating an optical switch characterized in that it comprises the following steps:

a) in a first substrate (S1) fabricating at least one input optical guide (31), a first and a second output optical guide (35,37), a recess (39) and a second set of electrodes (J2), the input optical guide and the first output optical guide having an identical optical axis called first optical axis, the second output optical guide having an optical axis called second optical axis, the first and the second optical axes respectively forming an angle α relative to an axis of symmetry (S),

b) in a second substrate (S2), fabricating a micromirror (41) and a first set of electrodes (J1), the micromirror being able to move between an output of the input optical guide and inputs of the first and second output optical guides, the micromirror comprising a reflector part (13) and an actuating part (15) having an axis of rotation (17) and able to drive the reflector part in rotation about a so-called tilt plane (B), the tilt plane being

perpendicular to a plane containing the axis of rotation, and said reflector part comprising at least one reflective face (R) in a plane parallel to the tilt plane able to reflect a light wave derived from the input optical guide towards the second output optical guide,

c) adding the second substrate onto the first substrate so that the micromirror is able to tilt within the recess.

10. Method for fabricating an optical switch as in claim 9, characterized in that the second substrate is a stack of a first carrier layer (50), a second layer (51) and a third layer (52) intended to form the micromirror.

11. Method for fabricating an optical switch as in claim 10, characterized in that the first carrier layer is a layer of silicon, the second layer is a layer of silicon oxide and the third layer is a silicon film, the micromirror being fabricated in said film.

12. Method for fabricating an optical switch as in claim 11, characterized in that said film is in monocrystalline silicon.

13. Method for fabricating an optical switch as in any of claims 9 to 12, characterized in that the fabrication of the micromirror at step B) comprises the following steps:

- etching the first carrier layer then the second layer so as to make an opening (33) in the second substrate exposing part of the third layer,
- etching the third layer so as to form the patterns corresponding to the reflector part (13) and the actuating part (15) of the micromirror, and to release said parts from the remainder of the third layer allowing said layer to subsist at the axis of rotation of the actuating part so that the micromirror remains joined to the second substrate (S2).
- depositing a reflective layer on all or part of a side face of the reflector part so as to form the reflective face (R) of the micromirror.